Course Syllabus

ELCT 530 – Industrial Controls

<table>
<thead>
<tr>
<th>Course Coordinator:</th>
<th>Dr. Herbert L. Ginn</th>
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<tr>
<td>Catalog Description:</td>
<td>The embedded electronics and software used in data acquisition, and process and instrument control in an industrial or manufacturing environment.</td>
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<td>Credit Hours</td>
<td>3</td>
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<td>Prerequisite(s) by course</td>
<td>ELCT 331</td>
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<tr>
<td>Prerequisite by topics</td>
<td>Control Systems</td>
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<td>Other Materials</td>
<td>Class notes posted on Blackboard; Additional reading material will integrate the textbook reading. Suitable sources will be referenced and provided on the course website or through Blackboard, as needed.</td>
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Course Outcomes:

Students who successfully complete this course will be able to:

- Program programmable logic controllers using ladder logic and other programming standards
- Apply basic skills necessary for cooperative and effective teaming
- Apply fundamentals of industrial measurement to control a process
- Create an appropriate model of an industrial process based on plant measurement
- Apply the fundamental of feedback control to design a PID controller
- Implement a PID controller using a standard industrial control platform such as a PCL

Course Topics:

- Programmable Logic Circuits
  - Overall, Programming procedures, basic functions, data handling functions, advanced functions, industrial communications
- Instrumentation and measurements for industrial applications
  - Sensors and transducers, signal conditioning, data acquisitions and manipulation, measurement uncertainty, calibration
- PID controllers
  - Design, tuning, implementation in PLC

Course Contribution to Program Outcomes:

ELCT 530 contributes to an achievement of:

- Outcome A – an ability to apply knowledge of mathematics, science and engineering
- Outcome B – an ability to design and conduct experiments, as well as to analyze and interpret data
- Outcome C – an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Outcome D – an ability to function on multidisciplinary teams
- Outcome E – an ability to identify, formulate, and solve engineering problems
- Outcome K – an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
General Course Policies

Academic Integrity
Unless otherwise stated, assignments and examination work are expected to be the sole effort of the student submitting the work. Students are expected to follow the University of South Carolina Honor Code and they should expect that every instance of a suspected violation will be reported. Students found responsible for violations of the Code will be subject to academic penalties under the Code in addition to whatever disciplinary sanctions are applied.

Accommodating Disabilities
Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

Diversity
When scheduling exams, I have attempted to avoid conflicts with major religious holidays. If, however, I have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let me know as soon as possible so that we can make other arrangements.

Recommended Study Habits
- Read the assigned material before class.
- Bring thoughtful questions to class for discussion.
- Prepare for the exams in study groups.
- Take notes during class discussions and while completing reading assignments.

Deviations
Minor deviations from the syllabus are a normal part of any adaptive teaching and learning process.